

Supporting Information for

Lending Practices to Same-sex Borrowers

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Supplemental Materials

This appendix contains three sections: Section 1 describes the sources of data, gives details on our data handling procedures, and provides definitions and summary statistics for key variables. Section 2 gives additional details on our model development and the underlying justifications for this development. Section 3 presents a set of supplementary robustness checks that address various concerns regarding the data and our same-sex measure. It also provides an in-depth discussion on disparate-treatment versus disparate-impact discrimination and offers a lender-level analysis based on this discussion.

1. Data Processing

The HMDA data from 1990 to 2012 are available from the National Archives' website. National HMDA data from 2013 to 2015 are likewise available from the Federal Financial Institutions Examination Council's website. We also collect the matching census data from these sources. Although our major loan analysis findings are derived from national HMDA data, we cross-validate our results using Boston Fed data. Because the public use version of the Boston Fed data does not include lender identification information, Ross and Yinger (6) merge it with the HMDA data and correct some coding errors in the original data. The cleaned-up version of the Boston Fed data is downloadable from John Yinger's website (37). The adjusted sample size from the Boston Fed data is 2,396. To be consistent with the Boston Fed's study and facilitate understanding of the degree of same-sex discrimination compared to other forms of discrimination cited in the earlier literature, for the HMDA data we follow literature by omitting incomplete or withdrawn loan applications(5) ending up with 2316 samples. We also omit all observations from borrowers who have missing values for the variables we use in this analysis; see Table S1 for a complete list of these variables. Furthermore, because identifying same-sex borrowers requires gender information for both

the main applicant and co-applicant, we drop observations that have only the main applicant on record for ease of comparison. We draw a 20% random sampling from the full data. The total number of observations is 28,988,939. We use this sample to compute summary statistics, as shown in Table S2. In the HMDA-based loan approval analysis, to use as much information as we can on same-sex borrowers, we include the full sample of identifiable same-sex observations and pool them with the 20% random sample of heterosexual observations. The total number of observations that we use in the loan approval analysis from national HMDA data is 33,664,547.

Fannie Mae loan performance data collection began in 2000. Regarding the HMDA data, since 2004, the HMDA has included additional information on approved loan characteristics, such as property type (e.g., single-family, manufactured homes), lien status (first, second, or non-secured), and rate spread. To take advantage of the expanded information in the HMDA, we use 2004 as the starting point for our cost and performance analysis. When merging this data with the Fannie Mae data, we keep all HMDA approval records regarding conventional loans that are secured by a first lien and are sold to Fannie Mae. We then merge these observations with Fannie Mae data based on the common variables available (38). To minimize matching errors, we only retain the matched pairs that are unique from both ends. Because all identified same-sex applicants from the HMDA have a co-applicant present by construction, to make a meaningful comparison, we keep only the merged non-same-sex applicants who also have a co-applicant on record. After the merge, we omit unusual observations that have loan-to-value ratios over 80% but lack any mortgage insurance policy (39). Finally, we drop the observations that have missing information on any baseline control variables in the later loan performance analysis. Our final sample in the cost and performance analysis consists of 420,175 loans acquired by Fannie Mae since 2004.

Finally, because Fannie Mae only reports location at the three-digit zip-code level, the successful matching rate is low when we require a unique two-sided match. Hence, it is worthwhile to see whether the matched sample is in anyway different from the corresponding HMDA population. In Table S7, we report the summary statistics of the key HMDA variables from both HMDA- and Fannie Mae-matched samples. Recall that the Fannie Mae-matched sample starts from 2004 and only includes approved conventional loans with co-applicants (for purchasing or refinancing purposes) on single-family units. To give an apples-to-apples comparison, we use these same criteria when calculating the HMDA-based summary statistics.

(Insert Table S7 Here)

Given the large data size, it is not surprising that, statistically, the means of all key variables are significantly different between the two samples. Practically, compared to the HMDA population, the Fannie Mae-matched sample includes more same-sex couples. Furthermore, the borrowers in the Fannie Mae-matched sample are less likely to be a minority and more likely to use the loan for purchasing purposes. In addition, they tend to have lower incomes and owner occupancy rates.

2. Model Developments

There are numerous studies on lending discrimination, although the literature focuses primarily on racially based discrimination. Ross and Yinger (6) provide a comprehensive review of this literature. As the authors pointed out, the key challenge facing scholars as they try to understand lending discrimination is that different lenders may use different underwriting standards. As a result, it is possible that, at the individual lender level, there is a common underwriting standard for everybody, and, therefore, no “discrimination.” However,

because applicants might be sorted disproportionately to different lenders, the sorting might lead certain types of applicants to be more (or less) likely to have their applications approved.

To address this concern, we follow the methodology used in (6) by examining several different lenders' underwriting models. The logit model, seen in equation S.1, is the baseline model in which we assume that all lenders share a common underwriting model. The details on variable definitions can be found in Table S.1.

$$\begin{aligned}
 \textit{Approve} = & \beta_0 + \beta_1 \textit{Same-Sex} + \beta_2 \textit{Lendershare} \\
 & + \beta_3 \textit{LTI} + \beta_4 \log \textit{Income} + \beta_5 \textit{Male} + \beta_6 \textit{Occupied} \\
 & + \beta_7 \textit{RaceDummies} + \beta_8 \textit{LoanPurposeDummies} \\
 & + \beta_9 \textit{loanTypeDummies} + \beta_{10} \textit{DemographicCtrl} + F.E. + \textit{error term}
 \end{aligned}$$

S.1

To examine the potential spillover effect, we further expand our analysis from equation S.1 by adding the *LG_CountyPct* and *Same-Sex* \times *LG_CountyPct* interaction terms, as well as various lender/state fixed effects to account for varied lenders' underwriting models in a simple, systematic way.

With the additional loan and borrower characteristics information from the Boston Fed data, we next add a comprehensive list of variables that measure loan applicants' financial, employment, educational, and demographic backgrounds. This model is shown in equation S.2.

$$\begin{aligned}
\text{Approve} = & \beta_0 + \beta_1 \text{Same-Sex} + \beta_2 \text{LG_TractPct} + \beta_3 \text{Co-applicant} + \beta_4 \text{Minority} \\
& + \beta_5 \log \text{Income} + \beta_6 \text{Male} + \beta_7 \text{Multi Family} \\
& + \beta_8 \text{Occupied} + \beta_9 \text{HETI} + \beta_{10} \text{TDI} + \beta_{11} \text{NetWorth} \\
& + \beta_{12} \text{Predicted Unemp} + \beta_{13} \text{Self-employed} + \beta_{14} \text{LTV} \\
& + \beta_{15} \text{PMI Denial} + \beta_{16} \text{Fixed Rate} + \beta_{17} \text{Special Program} \\
& + \beta_{18} \text{Loan Term} + \beta_{19} \text{Gift} + \beta_{20} \text{Cosigner} + \beta_{21} \text{At least 50} \\
& + \beta_{22} \text{Married} + \beta_{23} \text{Poor Tract} + \beta_{24} \text{Minority Tract} \\
& + \beta_{25} \text{Bankruptcy} \\
& + \beta_{26} \text{Mortgage Credit History} + \beta_{27} \text{Consumer Credit History} \\
& + \beta_{28} \text{LTV} + \beta_{29} \text{Short Work Exp.} + \beta_{30} \text{High School} + \beta_{31} \text{Dependents} \\
& + \text{Other Controls} + \text{F.E.} + \text{error term}
\end{aligned}$$

S.2

In addition to the lender/state fixed effects and the added control variables regarding applicants' characteristics, we further allow for variations in underwriting based on loan terms. That is, we allow lenders to put different underwriting weights on various loan and borrower characteristics, depending upon the nature of the loan. A clear example that demonstrates the importance of controlling for this type of variation is provided in (6):

“Consider, for example, a lender that specializes in high LTV loans and a common underwriting process in which the weight placed on the debt-to-income ratio is higher for loans with a high LTV. Under these circumstances, this lender will appear to place a higher weight on the debt to income ratio than do other lenders, even though this is not the case.” (p. 194)

To combat this potential problem, we first identify a list of key underwriting variables (i.e., house expense-to-income ratio, total debt expense-to-income ratio, loan-to-value ratio, bankruptcy history, and borrower's consumer and mortgage credit histories). We then construct pair-wise interaction terms for these variables and add them to our model.

As discussed in (6), if lenders indeed differ on their underwriting standards, and these variations are legitimate reflections of a perceived business necessity (hence, not indicative of discrimination), these variations should reflect either differences in the applications lenders receive or differences in lenders' past experiences. As a result, confirmation that potential "discrimination" in loan approval disappears after accounting for the link between a lender's underwriting standards and their portfolio will satisfy a necessary condition for the businesses' necessity defense (6). To address this issue and further control for lender underwriting standard variations, we identify a list of key lender portfolio variables as in (6). These variables are the percentage of conventional loans sold to the secondary market, average loan size, average applicant's income, and average loan-to-income ratio; we also include the pair-wise interactions of the previously identified key underwriting variables and the lender portfolio variables. The resulting model is our most comprehensive model using Boston Fed data.

At this point, we have formed models to test the likelihood of loan approval for same-sex borrowers, controlling for other social economic factors. To ensure convincing findings consistent with lending discrimination, we go one step further to check the loan cost and performance for approved applicants because, if same-sex borrowers are not discriminated against due to perceptions of their homosexual orientation, we should not expect any significant difference from the average cost and loan performance for the approved loans. However, if discrimination is found within the results, aside from individual deviations due to fundamental economic factors, we should expect that same-sex borrowers' loans would be

more profitable because approved same-sex borrowers shall have higher quality on average (26). Other evidence of discrimination might be if, in business practice, same-sex borrowers are charged extra fees to obtain a similar loan. We test the following situations for approved loans: the rate spread, the contractual rate, the loan spread disclosure, and the likelihood of a default or prepayment.

Since 2004, new rules state that a rate spread for a loan must be reported if it is above a certain threshold, as defined by the HMDA. Between January 2004 and September 2010, a loan's rate spread is defined as the difference between the APR on a loan and the prevalent rate on Treasury securities of comparable maturity. The HMDA mandates disclosure of rate spread if it is at least 3% for a loan secured by a first lien. In October 2010, HMDA changed its definition of rate spread to the difference between a loan's APR and a survey-based estimate of prevalent APR (instead of treasury rate) for comparable loans. Given this new definition, disclosure is required if a rate spread is above 1.5%. To check whether it is more likely that same-sex borrowers experience a higher spread than hetero-sex borrowers, meaning same-sex borrowers probably pay higher interest, we test the rate spread directly by regressing the rate spread on loan and borrower characteristics by using the following Tobit model in equation S.3.

$$\begin{aligned}
 \text{RateSpread} = & \beta_0 + \beta_1 \text{Same-Sex} + \beta_2 \text{Lendershare} + \beta_3 \text{Male} + \beta_4 \log \text{Income} \\
 & + \beta_5 \text{First Time Buyer} + \beta_6 \text{Num_Units} \\
 & + \beta_7 \text{Mortgage Insurance_Pct} + \beta_8 \text{RaceDummies} \\
 & + \beta_9 \text{LoanPurposeDummy} + \beta_{10} \text{Occupied} \\
 & + \beta_{11} \text{LoanToValueRatio Bins} + \beta_{12} \text{DebtToIncomeRatio Bins} \\
 & + \beta_{13} \text{CreditScore Bins} + \text{Other Controls} + F.E. + \text{error term}
 \end{aligned}$$

Following prior literature (8), throughout all models on loan cost and performance analysis, we include the combined loan to value ratio as a series of dummy variables for below 0.6, 0.6 to 0.8, 0.8 to 0.85, 0.85 to 0.9, 0.9 to 0.95, 0.95 to 1 and above. We add dummy variables for debt to income ratio around the threshold of 0.36 with bins as small as 0.03. We also add dummy variables for borrower and co-borrower credit score separately for below 600, above 820, and in 20 point bins otherwise.

Although the Tobit model is suitable to handle censored data, the extremely high rate of censoring rate in HMDA data might concern econometricians, let alone the strong normality assumption that the Tobit model makes. We use data from Fannie Mae to further analyze the original contractual rate (non-censored) using equation S.4.

$$\begin{aligned}
 CtrtRate = & \beta_0 + \beta_1 \textit{Same-Sex} + \beta_2 \textit{Lendershare} + \beta_3 \textit{Male} + \beta_4 \log \textit{Income} \\
 & + \beta_5 \textit{First Time Buyer} + \beta_6 \textit{Num_Units} \\
 & + \beta_7 \textit{Mortgage Insurance_Pct} + \beta_8 \textit{RaceDummies} \\
 & + \beta_9 \textit{LoanPurposeDummy} + \beta_{10} \textit{Occupied} \\
 & + \beta_{11} \textit{LoanToValueRatio Bins} + \beta_{12} \textit{DebtToIncomeRatio Bins} \\
 & + \beta_{13} \textit{CreditScore Bins} + \textit{Other Controls} + F.E. + \textit{error term}
 \end{aligned}$$

S.4

Alternatively, we define a dummy variable set to 1 if a loan has a reported spread, and 0 otherwise. We run the following logit model, as seen in equation S.5.

$$\begin{aligned}
\text{Disclosure} = & \beta_0 + \beta_1 \text{Same-Sex} + \beta_2 \text{Lendershare} + \beta_3 \text{Male} + \beta_4 \log \text{Income} \\
& + \beta_5 \text{First Time Buyer} + \beta_6 \text{Num_Units} \\
& + \beta_7 \text{Mortgage Insurance_Pct} + \beta_8 \text{RaceDummies} \\
& + \beta_9 \text{LoanPurposeDummy} + \beta_{10} \text{Occupied} \\
& + \beta_{11} \text{LoanToValueRatio Bins} + \beta_{12} \text{DebtToIncomeRatio Bins} \\
& + \beta_{13} \text{CreditScore Bins} + \text{Other Controls} + F.E. + \text{error term}
\end{aligned}$$

S.5

After checking financing costs, we calculate the likelihood of a default (or prepayment) on the loans for same-sex borrowers with the following logit model in equation S.6.

$$\begin{aligned}
\text{Default(Prepayment)} = & \beta_0 + \beta_1 \text{Same-Sex} + \beta_2 \text{CrrtRate} + \beta_3 \text{Male} \\
& + \beta_4 \log \text{Income} + \beta_5 \text{First Time Buyer} + \beta_6 \text{Num_Units} \\
& + \beta_7 \text{Mortgage Insurance_Pct} + \beta_8 \text{RaceDummies} \\
& + \beta_9 \text{LoanPurposeDummy} + \beta_{10} \text{Occupied} \\
& + \beta_{11} \text{LoanToValueRatio Bins} + \beta_{12} \text{DebtToIncomeRatio Bins} \\
& + \beta_{13} \text{CreditScore Bins} + \text{Other Controls} + F.E. + \text{error term}
\end{aligned}$$

S.6

Finally, conditional on the loans that are already in default, we employ a Cox proportional hazard model on the duration before the default to determine whether same-sex borrowers tend to default later than other comparable borrowers. Making more mortgage payments still mean less risk for the banks when we compare two defaults.

3. Robustness Checks and Extended Analysis

3.1. Robustness checks

We first run a balanced representation test for *Same-Sex*LG_CountyPct* using HMDA data. The result is reported in Table S8. The idea is to look at whether, after controlling for *Same-Sex* and *LG_CountyPct*, other HMDA control variables (starting from *Lendershare_County* in Table S8 but excluding fixed effects) can still predict *Same-Sex*LG_CountyPct*. The underlying F-statistic has an overwhelming value of 183.12 (p -value less than 0.0001), suggesting a clear failure in conditionally balanced representation of *Same-Sex*LG_CountyPct* among these observable characteristics.

(Insert Table S8 Here)

To rule out other explanations for the results, such as the potentially inaccurate proxy for sexual orientation and estimation bias, we conduct a series of robustness checks on both the Boston Fed and HMDA data. In Table S9, we address the concern that same-sex borrowers are more likely to live in multifamily units than single-family units and are more likely to have a co-signer than not. We restrict our Boston Fed sample to applicants for single-family units without a co-signer. The results are still qualitatively similar to those results without these constraints (i.e., the results in Table 2).

(Insert Table S9 Here)

To address the concern that same-sex mortgage applicants are younger on average, and to rule out potential parent–child pairs, in Table S10 we restrict our Boston Fed sample to applicants over 50 years old and with no dependents. Across columns, the lower approval rate finding is even stronger when we compare them to the *Same-Sex* coefficients in Table 2.

(Insert Table S10 Here)

Table S11 reports the robustness check on the HMDA national data. Although it is less usual that fathers and sons or brothers/sisters will buy a house together, we still need to exclude such cases to determine whether our results hold. We hence retain our sample for

same-sex couples only with different races. The results are essentially the same. In short, we find robust evidence consistent with unfavorable lending outcomes for same-sex borrowers and the two-sided spillover effect.

(Insert Table S11 Here)

Under the HMDA, since 2004, a rate spread for a loan must be reported if it surpasses a certain threshold. Because only loans with APRs well above average have disclosed rate spreads, we define a dummy variable called “*Disclosure*,” which is set to 1 if a loan has a reported spread, and 0 otherwise. We then run a linear probability model while controlling for an extensive set of loan and borrower characteristics. The results are reported in Table S12. Model 1 reports the baseline result, and we gradually add *LG_CountyPct*, its interaction with the *Same-Sex* dummy in subsequent models. We find consistently across models that, compared with loans that are otherwise similar, loans granted to same-sex borrowers are more likely to have a reported rate spread. The *Same-Sex* coefficient in Model 3 is 0.0114 (standard error 0.0039), which suggests that, holding other factors constant, same-sex borrowers are more likely to have a loan with a reported rate spread and, thus, a higher APR.

(Insert Table S12 Here)

Next, we investigate loan performance conditioning on loans that have experienced a default. For all loans with a record of at least 60 days’ delinquency, we measure how long it has been since origination before they are in default. We then run a Cox proportional hazard model on the duration before the default with a standard list of control variables. Our model specifications are identical to the previous logit analysis on default. The results are reported in Table S13. Interestingly, here, the *Same-Sex* coefficient is negative, although insignificant. A negative coefficient implies that, conditional on the loan’s already default status, same-sex borrowers tend to postpone defaults more often than non-same-sex borrowers. Obviously,

conditional on loans being in default, lenders prefer to see default happening later than sooner. The lack of significance makes it unwarranted to claim that same-sex borrowers perform better. However, we shall not forget that our control of financing cost (i.e., contractual rate) is likely to underestimate the true cost markup for same-sex borrowers. It is obvious from Table S13 that financing cost exhibits a significant impact on triggering default. So once again, there is certainly no evidence that same-sex borrowers are riskier for lenders, and the findings from the duration model weakly suggest that the opposite may be true if we have better measures of borrowers' financing costs.

(Insert Table S13 Here)

3.2. The types of lending discrimination

The presented findings thus far suggest that, compared with otherwise similar loan applicants, same-sex borrowers are more likely to have their applications turned down by lenders, and, conditional on being approved, they tend to be charged higher interest rates. One issue not yet investigated is the type of lending discrimination that our findings reveal. The courts implementing the federal fair lending laws broadly recognize two types of lending discrimination evidence: disparate treatment and disparate impact. See (6) for a comprehensive discussion on this matter.

Evidence for disparate treatment can be established by showing that during the lending practice, lenders explicitly use either prohibitory factors (overt evidence) or factors that are not justified by legitimate nondiscriminatory factors (comparative evidence).

Disparate impact, in contrast, happens when a lender applies a factor “neutral” policy to all credit applicants, but the policy or practice disproportionately excludes or burdens certain groups of people on a prohibited basis. One example, provided by the Federal Fair Lending Regulations and Statutes Overview (40), states, “A lender’s policy is to deny loan

applications for single-family residences for less than \$60,000. The policy has been in effect for ten years. This minimum loan amount policy is shown to disproportionately exclude potential minority applicants from consideration because of their income levels or the value of the houses in the areas in which they live.” This type of discrimination is much harder to prove because, at the lender level of the decision model, discriminatory factor coefficients, such as sexuality or minority status, may be insignificant. Practically, the courts will then determine whether the policy or practice can be justified by “business necessity.”

To begin to address this issue of discrimination type, we first examine whether same-sex applicants are distributed unevenly in lenders’ customer pools, which can potentially lead to disparate impact. In particular, using HMDA 20% data, we compute the proportion of same-sex applicants within each lender-state pair. We then regress the proportion based on lenders’ overall size ranking in percentile and average loan characteristics for each lender, plus the state fixed effects. Please note that our definition of a “lender,” which is identified by a unique combination of HMDA respondent ID and agency code, is somewhat narrower in scope due to data limitation; because the HMDA allows affiliated subsidiaries to use different respondent IDs, it is possible that multiple identified lenders actually belong to one parental financial institution. This is especially relevant for large financial institutions. Based on a report (41) from the Mortgage Bankers Association for 2010, 8,124 “lenders” reported data to the HMDA. After adjusting for their parent companies, the list was narrowed down to 6,700 financial institutions.

We report the results in Table S14. The overall findings provide evidence for disproportional clustering. It seems that same-sex applicants are more likely to choose lenders that also have a larger share of minority applicants. Furthermore, the summary statistics in Table S2 reveal that same-sex applicants tend to have higher loan-to-income ratios (LTIs).

Hence, it is no surprise to see from Table S14 that same-sex applicants are more likely to choose a lender willing to offer larger LTI loans. Another notable difference from the summary statistics is that same-sex applicants tend to have a higher income. Interestingly, Table S14 shows that same-sex borrowers are more likely to apply for a loan from a lender whose average customer has a lower income. Shopping this way, the comparative income advantage for same-sex borrowers becomes larger, which could strengthen their profiles in competing for loans. Finally, there is no evidence that lender size matters when same-sex borrowers decide from which institution to borrow.

(Insert Table S14 Here)

Next, to distinguish disparate treatment from disparate impact, we rerun the loan approval and credit cost regressions at the lender level. A significant coefficient for our key variable, *Same-Sex*, would be consistent with disparate treatment; an insignificant coefficient would suggest either no discrimination from that lender or discrimination subject to a potential disparate impact investigation. To minimize the noise from the many small lenders, and for economic significance, we restrict our attention to the top 100 lenders identified in the merged HMDA-Fannie Mae data when we run the lender-level OLS regressions. For the same lenders, we also refer back to the HMDA 20% sample and run the lender-level loan approval linear probability regression for all the loans those lenders processed. Because we now run lender-level regressions, we can remove all lender-related fixed effects. Furthermore, to reserve the degree of freedom, we adopt the county fixed effects in approval regression, and the state fixed effects in contractual rate regression. Given our primary interest is in the overall impact on same-sex borrowers, our model specifications are similar to the specifications of the models used in Table 4 (column 1) and Table 6 (column 1) with the exception that we now use the

linear probability model for loan approval regression (42). We plot the values of the *Same-Sex* coefficient for all top 100 lenders in Figure S2, in which lender size 1 is the largest.

(Insert Figure S2 Here)

The results show that many lenders internally might treat *Same-Sex* status unfavorably. This is particularly true when lenders come to loan approval decisions. With respect to the mortgage cost, although we see fewer lenders “overcharge” same-sex borrowers on their interest rates upon approval, the incidence of this kind of business practice seems to be still noticeable, especially among large lenders on the market.

In both models and for lenders with either 10% insignificant or unexpected signs on the *Same-Sex* coefficient, we pool them together to investigate whether unfavorable outcomes for same-sex borrowers emerge again. As we pool multiple lenders, we adopt a more inclusive model specification by adding back the lender fixed effects, *LG_CountyPct*, and its interaction with the *Same-Sex* coefficient. The results are reported in Table S15. For the main *Same-Sex* coefficient, we again find a negative 5% significant result in the loan approval model and a positive 1% significant result in the mortgage rate model. Hence, for lenders who pass the individual disparate treatment test, there is collective evidence that same-sex borrowers jointly are likely subject to unfavorable credit outcomes. This also is consistent with a potential disparate impact, due to the unbalanced clustering of same-sex loan applicants among lenders.

(Insert Table S15 Here)

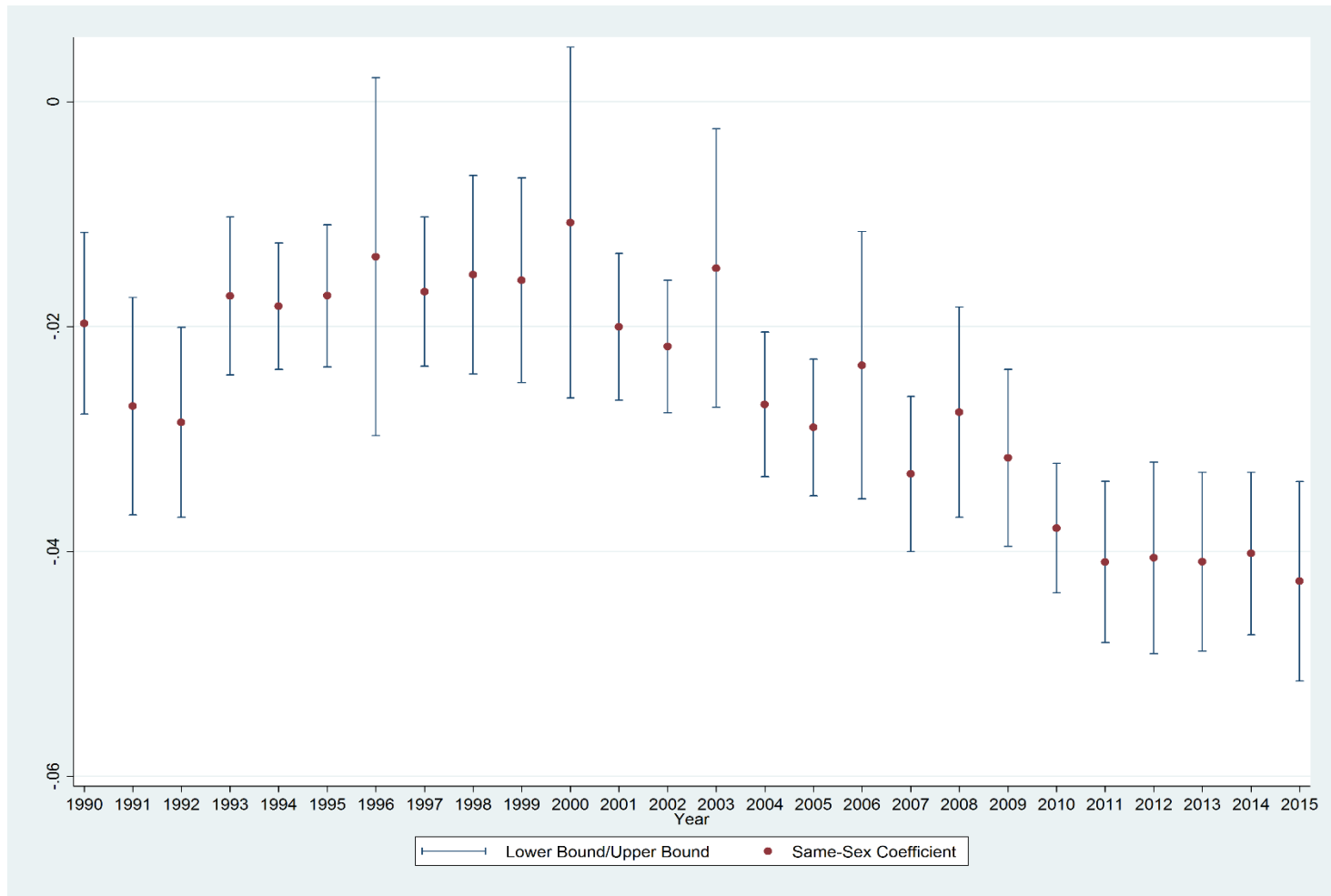


Figure S1. This figure shows the value of Same-Sex coefficient and its associated 5% confidence interval from a loan approval regression, using the full sample of national HMDA data year by year. The model specification here is similar to linear probability (3) in Table 4, with the exception that we further add lender*county fixed effects, and we drop the year fixed effects as it is no longer relevant.

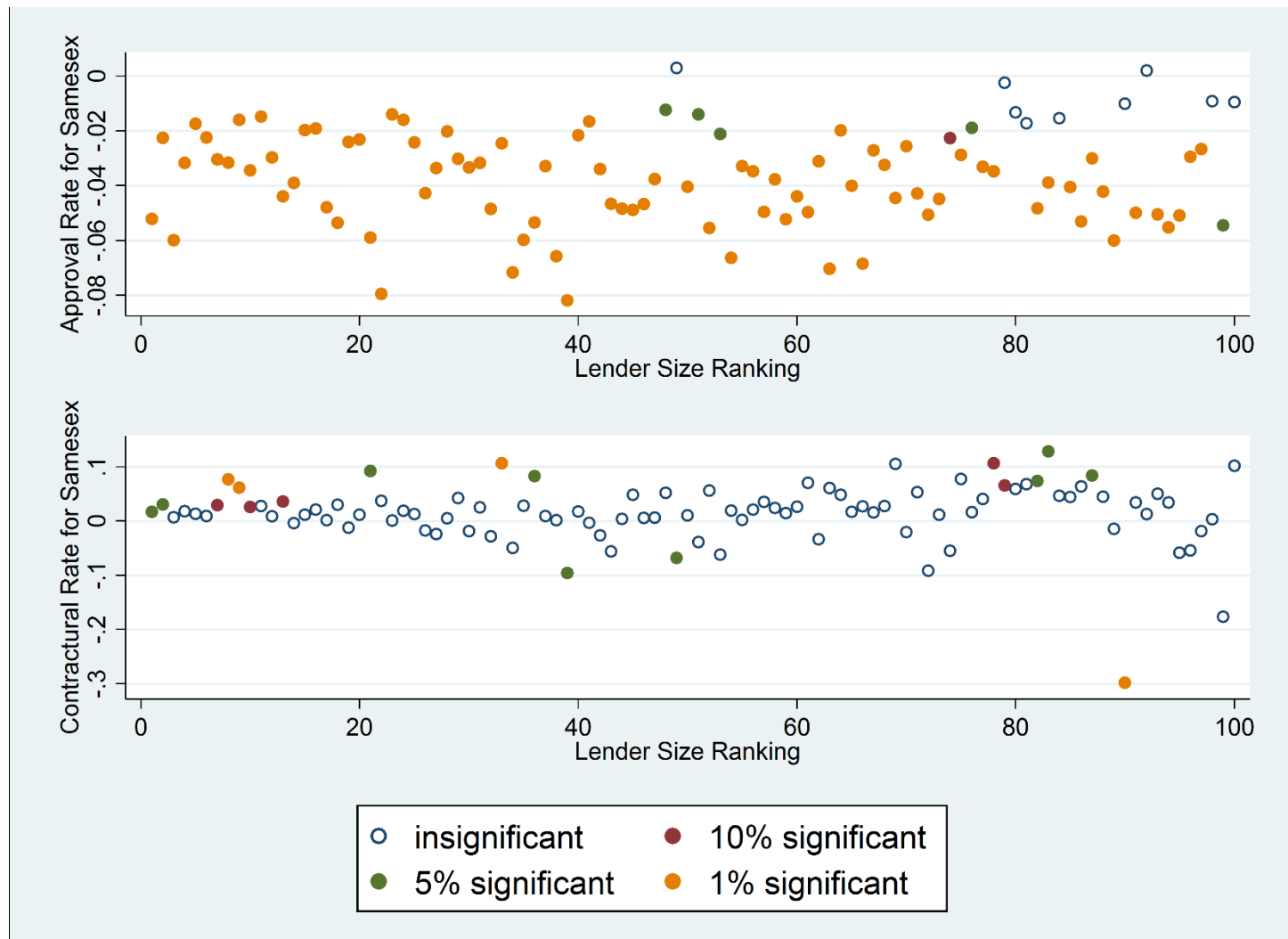


Figure S2: Graph of the “*Same-Sex*” Coefficient from Lender Level Loan Approval and Cost Regressions

Table S1: Variable Definitions

Part A: Loan information		
Variable Name	Meaning	Used at
Approve	Dummy if loan application is approved	HMDA&Boston Fed
Occupied	Dummy if Occupied as a principal dwelling	HMDA&Boston Fed&Fannie Mae
Loan Amount	Loan Amount on contract	HMDA
Loan Purpose	1: Home purchase 2: Home Improvement 3: Refinancing	HMDA
Loan Type	1: Conventional 2: FHA 3: VA 4: FSA/RHS	HMDA
Loan to Income	Loan to Income Ratio	HMDA
PMI Denial	Dummy if applicant applied PMI and was denied	Boston Fed
LTV	Loan to Value Ratio	Boston Fed
High LTV	Dummy if LTV is above 1	Boston Fed
Extreme LTV	Dummy if LTV is above 2	Boston Fed
Loan Term	Term in years	Boston Fed
Fixed Rate	Fixed rate mortgage dummy	Boston Fed
Multi-family	Dummy for multi-family unit	Boston Fed
Special Program	Dummy for special program loan	Boston Fed
Lendershare_County	Lenders' market share in a county (annually)	HMDA
Part B: Borrower information		
Variable Name	Meaning	Used at
Same-Sex	Dummy, equals 1 if applicant and co-applicant are of the same sex	HMDA&Boston Fed
Annual Income	Total annual income	HMDA&Boston Fed
Co-applicant	Dummy if co-applicant is present	HMDA&Boston Fed
LG_CountyPct	Percentage of Same-Sex borrowers in a county (annually)	HMDA
LG_TractPct	Percentage of Same Sex borrowers in a tract (annually)	HMDA
Male	Dummy for Male Applicant	HMDA
Black	Dummy for Black applicant	HMDA
Hispanic	Dummy for Hispanic/Latino applicant	HMDA
Asian	Dummy for Asian applicant	HMDA
Other race	Dummy for other minority applicant	HMDA
Minority	Dummy for all minority applicant	Boston Fed
HETI	Housing expense-to-income ratio	Boston Fed
TDIT	Total debt expense-to-income ratio	Boston Fed
Net Worth	Net worth of applicant (in thousands)	Boston Fed
Cosigner	Dummy for Cosigner (other than co-applicant)	Boston Fed
Married	Dummy if applicant is married	Boston Fed
Consumer Credit History	Applicant's consumer credit history (See Boston Fed study for definition)	Boston Fed
Mortgage Credit History	Applicant's mortgage credit history (See Boston Fed study for definition)	Boston Fed
Bankruptcy	Dummy if applicant has public recorded bankruptcy	Boston Fed
Gift	Dummy for gift is used in down payment	Boston Fed
Predicted Unemp	Predicted unemployment probability for applicant (See Boston Fed Study)	Boston Fed
Short Work Experience	Dummy if applicant has less than two year's job experience	Boston Fed
Self-employed	Dummy if applicant is self-employed	Boston Fed
At Least 50	Dummy if applicant is over 50	Boston Fed
High School	Dummy if applicant has finished at least high school	Boston Fed

Dependent	# of dependent of applicant	Boston Fed
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Part C: Census tract information		
Variable Name	Meaning	Used at
Poor Tract	Dummy for poor tract (income below area median)	HMDA&Boston Fed
Minority Tract	Dummy if tract has over 30% Minority	HMDA&Boston Fed
LnPOP_tract	Log of total population in tract	HMDA
FMI_tract	Median family income in tract	HMDA
Unit/Pop	# of Occupied units per capital in tract	HMDA
Age_tract	Median age of residents in tract	HMDA
Houseage_tract	Median house age in tract	HMDA
Male_tract	Proportion of male in tract	HMDA
LnHV_tract	Log of median house vale in tract	HMDA

Part D: Lender's mortgage portfolio information (all in 1990)		
Variable Name	Meaning	Used at
CONVshare	Percent of conventional loans sold at secondary market by lender	Boston Fed
Loansize_lender	Average loan size made by lender	Boston Fed
Income_lender	Average applicant's income by lender	Boston Fed
LTI_lender	Average loan to income ratio by lender	Boston Fed

Part E: Loan cost and performance information		
Variable Name	Meaning	Used at
Original rate	Original interest rate	Fannie Mae
OLTV	Original combined loan-to-value ratio	Fannie Mae
DTI	Debt-to-income ratio	Fannie Mae
Log Income	Log income	Fannie Mae
Borrower Score	Borrower credit score	Fannie Mae
Co-Borrower Score	Co-borrower credit score	Fannie Mae
First Time	Dummy for first-time home buyer	Fannie Mae
Num_unit	Number of units	Fannie Mae
Mortgage		
Insurance_pct	Mortgage insurance percentage	Fannie Mae
Loan purpose	Dummy for refinance (in contrast to purchase)	Fannie Mae

Table S2: Summary Statistics for Key Variables (Mean, Std Dev)

Variables	Full Sample (STD)	<i>Same-Sex</i> =0 (STD)	<i>Same-Sex</i> =1 (STD)	Two Sample t test (p-level)
Approve (HMDA)	0.8250 (0.3800)	0.8274 (0.3779)	0.7682 (0.4220)	*** (0.0000)
Same-Sex (HMDA)	0.0403 (0.1966)	N/A	N/A	N/A
LG_CountyPct (HMDA)	4.1523 (1.8226)	4.1177 (1.7914)	4.9746 (2.3030)	*** (0.0000)
Lendershare_County (HMDA)	3.7578 (4.8558)	3.7690 (4.8642)	3.4903 (4.6414)	*** (0.0000)
Loan to Income (HMDA)	1.8523 (1.2774)	1.8514 (1.2717)	1.8747 (1.4065)	*** (0.0000)
Loan Amount (\$000s) (HMDA)	159.3674 (165.2771)	159.6204 (165.6286)	153.3385 (156.5490)	*** (0.0000)
Annual Income (\$000s) (HMDA)	97.7372 (125.5848)	97.4595 (123.2398)	104.3517 (172.1206)	*** (0.0000)
Occupied (HMDA)	0.9233 (0.2661)	0.9250 (0.2634)	0.8834 (0.3209)	*** (0.0000)
Approve (Boston Fed)	0.8549 (0.3523)	0.8567 (0.3505)	0.7971 (0.4051)	(0.1663)
Income (\$000s) (Boston Fed)	76.1072 (67.3506)	75.9923 (67.4778)	79.8398 (63.4164)	(0.6403)
HEI (Boston Fed)	25.2734 (9.7264)	25.3116 (9.7274)	24.0310 (9.6804)	(0.2815)
TDTI (Boston Fed)	33.1560 (11.0951)	33.1569 (10.9940)	33.1274 (14.0955)	(0.9826)
Net Worth (\$000s) (Boston Fed)	0.2298 (0.9873)	0.2311 (0.9999)	0.1863 (0.3972)	(0.7105)
Predicted Unemp (Boston Fed)	3.7876 (2.0366)	3.7853 (2.0342)	3.8623 (2.1279)	(0.7571)
Self Employed (Boston Fed)	0.1231 (0.3286)	0.1246 (0.3304)	0.0725 (0.2612)	(0.1942)
LTV (Boston Fed)	0.7653 (0.2807)	0.7650 (0.2827)	0.7773 (0.2063)	(0.7194)
PMI Denial (Boston Fed)	0.0194 (0.1381)	0.0200 (0.1401)	0 (0)	(0.2354)
Multi-family (Boston Fed)	0.1403 (0.3474)	0.1366 (0.3435)	0.2609 (0.4423)	*** (0.0034)
Fixed Rate (Boston Fed)	0.6576 (0.4746)	0.6573 (0.4747)	0.6667 (0.4749)	(0.8720)
Special Program (Boston Fed)	0.1718 (0.3773)	0.1700 (0.3757)	0.2319 (0.4251)	(0.1797)

Loan Term (Boston Fed)	28.7244 (5.1376)	28.7694 (5.0478)	27.2899 (7.4065)	** (0.0185)
Gift (Boston Fed)	0.1861 (0.3893)	0.1918 (0.3938)	0 (0)	*** (0.0001)
Cosigner (Boston Fed)	0.0358 (0.1859)	0.0338 (0.1808)	0.1014 (0.3041)	*** (0.0029)
At Least 50 (Boston Fed)	0.4642 (0.4988)	0.4747 (0.4993)	0.2174 (0.4155)	*** (0.0000)
Male (Boston Fed)	0.7794 (0.4148)	0.7859 (0.4103)	0.5652 (0.4994)	*** (0.0000)
Married (Boston Fed)	0.5920 (0.4916)	0.6101 (0.4878)	0 (0)	*** (0.0000)
Occupied (Boston Fed)	0.9598 (0.1964)	0.9595 (0.1972)	0.9710 (0.1690)	(0.6315)
Bankruptcy (Boston Fed)	0.0812 (0.2732)	0.0801 (0.2715)	0.1159 (0.3225)	(0.2832)
Mortgage Credit History (Boston Fed)	1.7453 (0.5330)	1.7468 (0.5350)	1.6957 (0.4635)	(0.4327)
Consumer Credit History (Boston Fed)	2.1706 (1.7161)	2.1709 (1.7151)	2.1594 (1.7625)	(0.9546)
High School (Boston Fed)	0.7409 (0.4382)	0.7414 (0.4379)	0.7246 (0.4500)	(0.7539)
Short Work Experience (Boston Fed)	0.0885 (0.2841)	0.0859 (0.2803)	0.1739 (0.3818)	** (0.0112)
Dependent (Boston Fed)	0.7845 (1.1114)	0.8042 (1.1193)	0.1449 (0.4933)	*** (0.0000)
OLTV (Fannie Mae)	74.2732 (15.6316)	74.3010 (15.6324)	73.6033 (15.5973)	*** (0.0000)
DTI (Fannie Mae)	33.9575 (11.1895)	33.9031 (11.1742)	35.2725 (11.4750)	*** (0.0000)
Borrower Score (Fannie Mae)	753.8248 (48.4005)	753.9804 (48.3368)	750.0820 (49.7632)	*** (0.0000)
Co-Borrower Score (Fannie Mae)	756.3145 (47.9988)	756.3955 (47.9335)	754.3646 (49.5047)	*** (0.0000)
First Time (Fannie Mae)	0.1169 (0.3213)	0.1144 (0.3182)	0.1774 (0.3820)	*** (0.0000)
Num_unit (Fannie Mae)	1.0778 (0.3798)	1.0738 (0.3706)	1.1740 (0.5487)	*** (0.0000)
Mortgage Insurance_pct (Fannie Mae)	5.5181 (10.7624)	5.5490 (10.7870)	4.7733 (10.1243)	*** (0.0000)

Note: Calculated based on 20% HMDA national data, Boston-Fed data and HMDA-Fannie Mae matched data.

Table S3: Loan Applications Sorted by Purpose and Loan Program

Panel A. Loan Applications sorted by Purpose

# of Received Applicants	<i>Same-Sex</i>	Purchase	Improvement	Refinancing	Row Total
No		10,372,452 (94.57%)	2,453,051 (96.51%)	14,995,533 (96.88%)	27,821,036 (95.97%)
Yes		595,487 (5.43%)	88,833 (3.49%)	483,583 (3.12%)	1,167,903 (4.03%)
Column Total		10,967,939 (37.83%)	2,541,884 (8.77%)	15,479,116 (53.40%)	28,988,939 (100%)
# of Approved Applications	<i>Same-Sex</i>	Purchase	Improvement	Refinancing	Row Total
No		9,005,866 (94.95%)	1,814,448 (97.10%)	12,197,951 (97.10%)	23,018,265 (96.25%)
Yes		479,279 (5.05%)	54,218 (2.90%)	363,702 (2.90%)	897,199 (3.75%)
Column Total		9,485,145 (39.66%)	1,868,666 (7.81%)	12,561,653 (52.53%)	23,915,464 (100%)
Raw Approval Rate	<i>Same-Sex</i>	Purchase	Improvement	Refinancing	Row Total
No		86.82%	73.97%	81.34%	82.74%
Yes		80.48%	61.03%	75.21%	76.82%

Panel B: Loan Applications sorted by Loan Program

# of Received Applications	<i>Same-Sex</i>	Conventional	FHA	VA	Row Total
No		25,116,803 (96.22%)	1,931,534 (91.95%)	685,816 (98.75%)	27,821,036 (95.97%)
Yes		987,633 (3.78%)	169,101 (8.05%)	8,698 (1.25%)	1,167,903 (4.03%)
Column Total		26,104,436 (90.05%)	2,100,635 (7.25%)	694,514 (2.40%)	28,988,939 (100%)
# of Approved Applications	<i>Same-Sex</i>	Conventional	FHA	VA	Row Total
No		20,729,860 (96.52%)	1,619,381 (92.00%)	595,654 (98.80%)	23,018,265 (96.25%)
Yes		747,153 (3.48%)	140,847 (8.00%)	7,211 (1.20%)	897,199 (3.75%)
Column Total		21,477,013 (89.80%)	1,760,228 (7.36%)	602,865 (2.52%)	23,915,464 (100%)
Raw Approval Rate	<i>Same-Sex</i>	Conventional	FHA	VA	Row Total
No		82.53%	83.84%	86.85%	82.74%
Yes		75.65%	83.08%	82.90%	76.82%

Note: Calculated based on 20% HMDA national data.

Table S4: More HMDA Based Linear Probability Models

Variables	Model (1) Approve	Model (2) Approve	Model (3) Approve	Model (4) Approve	Model (5) Approve	Model (6) Approve
Same-Sex	-0.0575*** (0.0048)	-0.0718*** (0.0047)	-0.0488*** (0.0042)	-0.0489*** (0.0042)	-0.0360*** (0.0024)	-0.0324*** (0.0030)
LG_CountyPct	-0.0101*** (0.0020)	-0.0106*** (0.0022)	-0.0092*** (0.0020)	-0.0093*** (0.0019)	-0.0039*** (0.0008)	-0.0025** (0.0010)
Same-Sex * LG_CountyPct	0.0044*** (0.0007)	0.0048*** (0.0008)	0.0042*** (0.0008)	0.0042*** (0.0008)	0.0016*** (0.0004)	0.0010** (0.0004)
Lendershare_County		0.0010 (0.0013)	0.0011 (0.0012)	0.0011 (0.0012)	0.0026*** (0.0005)	0.0024*** (0.0006)
LTI		-0.0253*** (0.0017)	-0.0127*** (0.0028)	-0.0127*** (0.0028)	-0.0185*** (0.0011)	-0.0194*** (0.0015)
Loan Occupancy		-0.0249*** (0.0081)	-0.0038 (0.0062)	-0.0038 (0.0062)	0.0215*** (0.0028)	0.0221*** (0.0039)
Purpose: Improvement		-0.1453*** (0.0136)	-0.1245*** (0.0142)	-0.1247*** (0.0142)	-0.0887*** (0.0153)	-0.0801*** (0.0161)
Purpose: Refinance		-0.0621*** (0.0121)	-0.0612*** (0.0116)	-0.0612*** (0.0116)	-0.0345*** (0.0048)	-0.0309*** (0.0062)
Loan Type: FHA		0.0459*** (0.0103)	0.0545*** (0.0101)	0.0545*** (0.0101)	0.0014 (0.0046)	-0.0084 (0.0053)
Loan Type: VA		0.0483*** (0.0132)	0.0466*** (0.0125)	0.0467*** (0.0124)	0.0124*** (0.0043)	0.0015 (0.0044)
Loan Type: FSA/RHS		0.0447*** (0.0125)	0.0589*** (0.0131)	0.0589*** (0.0130)	0.0047 (0.0108)	-0.0089 (0.0150)
Log Income			0.0536*** (0.0074)	0.0535*** (0.0074)	0.0304*** (0.0030)	0.0269*** (0.0040)
Male			0.0496*** (0.0044)	0.0496*** (0.0044)	0.0227*** (0.0014)	0.0214*** (0.0017)
Hispanic			-0.0644*** (0.0031)	-0.0645*** (0.0031)	-0.0525*** (0.0036)	-0.0525*** (0.0050)
Black			-0.1300*** (0.0041)	-0.1301*** (0.0041)	-0.0890*** (0.0031)	-0.0884*** (0.0038)
Asian			-0.0245*** (0.0024)	-0.0246*** (0.0025)	-0.0266*** (0.0015)	-0.0241*** (0.0021)
Other race			-0.0908*** (0.0119)	-0.0909*** (0.0119)	-0.0571*** (0.0056)	-0.0511*** (0.0056)
Census Tract Demographic Controls	N	N	N	Y	Y	Y
Census Tract fixed effects	Y	Y	Y	Y	Y	N
Year fixed effects	Y	Y	Y	Y	Y	Y
Lender fixed effects	N	N	N	N	Y	N
Lender*Census Tract fixed effects	N	N	N	N	N	Y
Constant	Y	Y	Y	Y	Y	Y
N	33,664,547	33,664,547	33,664,547	33,664,547	33,664,547	33,664,547
adj. R2	0.0525	0.0694	0.0824	0.0825	0.1973	0.2716

Note: This table presents linear probability regression results. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S5: Logit Model on Mortgage Default

Variables	Logit (1) Default	Logit (2) Default	Logit (3) Default	Logit (4) Default
Same-Sex	-0.0354 (0.0561)	-0.0349 (0.0563)	0.0798 (0.1498)	0.0614 (0.1461)
LG_CountyPct		-0.0133 (0.0374)	-0.0123 (0.0379)	-0.0056 (0.0366)
Same-Sex*LG_CountyPct			-0.0214 (0.0293)	-0.0197 (0.0281)
Contractual Rate	0.3979*** (0.0293)	0.3980*** (0.0293)	0.3979*** (0.0292)	0.3807*** (0.0293)
Lendershare_County				-0.0230*** (0.0049)
Male	-0.0203 (0.0296)	-0.0203 (0.0296)	-0.0199 (0.0296)	-0.0208 (0.0300)
Log Income	-0.1039*** (0.0252)	-0.1040*** (0.0253)	-0.1039*** (0.0253)	-0.1035*** (0.0259)
First Time	-0.2082*** (0.0446)	-0.2083*** (0.0446)	-0.2081*** (0.0445)	-0.2101*** (0.0449)
Num_Units	0.0924*** (0.0325)	0.0925*** (0.0325)	0.0928*** (0.0326)	0.0956*** (0.0332)
Mortgage Insurance_Pct	0.0067* (0.0037)	0.0067* (0.0037)	0.0067* (0.0037)	0.0065* (0.0038)
Hispanic	0.1634*** (0.0436)	0.1632*** (0.0436)	0.1633*** (0.0436)	0.1668*** (0.0444)
Black	0.1890*** (0.0498)	0.1890*** (0.0498)	0.1891*** (0.0498)	0.1932*** (0.0498)
Asian	0.0311 (0.0594)	0.0312 (0.0594)	0.0314 (0.0594)	0.0352 (0.0598)
Other race	0.1572 (0.1109)	0.1573 (0.1109)	0.1563 (0.1109)	0.1605 (0.1137)
Loan purpose	0.5300*** (0.0271)	0.5300*** (0.0272)	0.5300*** (0.0271)	0.5211*** (0.0277)
Occupancy	-0.1175*** (0.0374)	-0.1176*** (0.0373)	-0.1181*** (0.0376)	-0.1235*** (0.0381)
OLTV Bins	Y	Y	Y	Y
DTI Bins	Y	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y	Y
Loan Month fixed effects	Y	Y	Y	Y
County fixed effects	Y	Y	Y	Y
Lender fixed effects	N	N	N	Y
Constant	Y	Y	Y	Y
N	209,887	209,887	209,887	209,887

Note: This table presents logit regression results for mortgage default. Standard errors in parentheses are robust and clustered at the MSA level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S6: Logit Model on Mortgage Prepayment

Variables	Logit (1) Prepayment	Logit (2) Prepayment	Logit (3) Prepayment	Logit (4) Prepayment
Same-Sex	-0.1103*** (0.0252)	-0.1087*** (0.0252)	-0.0951* (0.0539)	-0.1082* (0.0554)
LG_CountyPct		-0.0497*** (0.0170)	-0.0496*** (0.0170)	-0.0462*** (0.0173)
Same-Sex*LG_CountyPct			-0.0027 (0.0089)	-0.0008 (0.0093)
Contractual Rate	0.3318*** (0.0190)	0.3322*** (0.0190)	0.3322*** (0.0190)	0.3357*** (0.0189)
Lendershare_County				0.0009 (0.0021)
Male	0.0469*** (0.0145)	0.0469*** (0.0145)	0.0470*** (0.0145)	0.0373** (0.0146)
Log Income	0.3285*** (0.0121)	0.3282*** (0.0121)	0.3283*** (0.0121)	0.3184*** (0.0120)
First Time	-0.1352*** (0.0189)	-0.1359*** (0.0189)	-0.1359*** (0.0189)	-0.1305*** (0.0192)
Num_Units	-0.2045*** (0.0182)	-0.2045*** (0.0183)	-0.2045*** (0.0183)	-0.2039*** (0.0179)
Mortgage Insurance_Pct	-0.0042* (0.0023)	-0.0043* (0.0023)	-0.0043* (0.0023)	-0.0046** (0.0023)
Hispanic	-0.1977*** (0.0227)	-0.1987*** (0.0227)	-0.1986*** (0.0227)	-0.1905*** (0.0228)
Black	-0.2133*** (0.0337)	-0.2119*** (0.0337)	-0.2118*** (0.0337)	-0.2090*** (0.0331)
Asian	0.0164 (0.0345)	0.0163 (0.0343)	0.0164 (0.0344)	0.0297 (0.0309)
Other race	-0.0623 (0.0690)	-0.0625 (0.0690)	-0.0626 (0.0691)	-0.0571 (0.0687)
Loan purpose	-0.3056*** (0.0130)	-0.3056*** (0.0130)	-0.3056*** (0.0130)	-0.3015*** (0.0130)
Occupancy	-0.6725*** (0.0193)	-0.6730*** (0.0193)	-0.6731*** (0.0193)	-0.6696*** (0.0194)
OLTV Bins	Y	Y	Y	Y
DTI Bins	Y	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y	Y
Loan Month fixed effects	Y	Y	Y	Y
County fixed effects	Y	Y	Y	Y
Lender fixed effects	N	N	N	Y
Constant	Y	Y	Y	Y
N	209,887	209,887	209,887	209,887

Note: This table presents logit regression results for mortgage Prepayment. Standard errors in parentheses are robust and clustered at the MSA level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S7: Summary Statistics for Key HMDA Variables (Mean, Std) 2004-2015

Variables	HMDA Sample (STD)	Fannie Mae Matched Sample (STD)	Two Sample t test (p-level)
Same-Sex	0.0366 (0.1877)	0.0404 (0.1969)	*** (0.0000)
LG_CountyPct	4.2951 (1.6928)	4.2707 (1.8848)	*** (0.0000)
Lendershare_County	3.9559 (5.2188)	4.7386 (5.3736)	*** (0.0000)
Loan to Income	2.0417 (1.2507)	2.0576 (1.4319)	*** (0.0000)
Loan Amount (\$000s)	221.8899 (197.7121)	215.0313 (122.8616)	*** (0.0000)
Annual Income (\$000s)	127.7274 (152.9153)	127.2458 (110.9081)	** (0.0374)
Occupied	0.8802 (0.3247)	0.6966 (0.4597)	*** (0.0000)
Black	0.0347 (0.1829)	0.0276 (0.1638)	*** (0.0000)
Hispanic	0.0613 (0.2398)	0.0519 (0.2218)	*** (0.0000)
Asian	0.0549 (0.2278)	0.0484 (0.2247)	*** (0.0000)
Other race	0.0075 (0.0865)	0.0057 (0.0754)	*** (0.0000)
Male	0.8423 (0.3644)	0.8491 (0.3579)	*** (0.0000)
Purpose: purchase	0.3697 (0.4827)	0.5434 (0.4981)	*** (0.0000)
Purpose: refinance	0.6303 (0.4827)	0.4566 (0.4981)	*** (0.0000)

Note: Calculated based on 100% HMDA national data and HMDA-Fannie Mae merged data.

Table S8: Balanced Representation Test on *Same-Sex*LG_CountyPct*

Variables	OLS <i>Same-Sex*LG_CountyPct</i>
Same-Sex	4.7444*** (0.0314)
LG_CountyPct	0.2496*** (0.0127)
Lendershare_County	0.0040*** (0.0005)
LTI	0.0063*** (0.0005)
Log Income	0.0115*** (0.0015)
Male	0.0580*** (0.0035)
Loan Occupancy	0.0533*** (0.0020)
Hispanic	0.0246*** (0.0025)
Black	0.0336*** (0.0082)
Asian	-0.0051** (0.0020)
Other race	-0.0143*** (0.0041)
Purpose: Improvement	0.0036 (0.0041)
Purpose: Refinance	0.0040** (0.0018)
Loan Type: FHA	-0.0180*** (0.0047)
Loan Type: VA	0.0322*** (0.0031)
Loan Type: FSA/RHS	0.0178*** (0.0036)
Census Tract Demographic Controls	Y
Year fixed effects	Y
Lender fixed effects	Y
Census Tract fixed effects	Y
Constant	Y
N	33,664,547
adj. R2	0.8637

Note: Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S9: Robustness Check with Boston Fed Data: A

Variables	Logit (1) Approve	Logit (2) Approve	Logit (3) Approve	Logit (4) Approve	Logit (5) Approve
Same-Sex	-0.9763*** (0.3283)	-1.4106*** (0.4539)	-1.6854*** (0.5054)	-1.7631** (0.7026)	-0.5090 (1.0933)
[Average Marginal Effect]	[-0.1055]	[-0.1105]	[-0.1128]	[-0.1053]	[-0.0303]
LG_TractPct	-0.0092 (0.0114)	-0.0207 (0.0160)	-0.0248 (0.0168)	-0.0206 (0.0184)	-0.0061 (0.0200)
[Average Marginal Effect]	[-0.0010]	[-0.0016]	[-0.0017]	[-0.0012]	[-0.0004]
Same-Sex*LG_TractPct					-0.0772** (0.0371)
[Average Marginal Effect]					[-0.0046]
Co-applicant	0.2295 (0.3751)	0.4900 (0.5809)	0.9174 (0.6549)	1.0624 (0.6764)	1.1615* (0.6791)
Co-applicant* LG_TractPct	0.2501 (0.2825)	0.3136 (0.3628)	0.0136 (0.3614)	-0.0478 (0.4081)	-0.1450 (0.3995)
Minority	-0.7908*** (0.1636)	-0.5362** (0.2310)	-0.5404* (0.2905)	-0.2538 (0.3112)	-0.2880 (0.3187)
Log Income	0.1902 (0.1779)	0.0612 (0.2166)	0.0000 (0.2520)	0.3067 (0.3307)	0.3225 (0.3298)
Male	-0.6278*** (0.2110)	-0.6399*** (0.2247)	-0.6272** (0.2638)	-0.5944** (0.2431)	-0.5767** (0.2406)
Multi-Family	N/A	N/A	N/A	N/A	N/A
Owner Occupied	0.6252 (0.4360)	1.3352*** (0.3564)	1.4228*** (0.4673)	1.0892** (0.4469)	1.0989** (0.4396)
HETI		-0.0087 (0.0156)	-0.0133 (0.0202)	-0.1085 (0.1806)	-0.1187 (0.1823)
TDII		-0.0501*** (0.0175)	-0.0674*** (0.0218)	0.2059 (0.1374)	0.2173 (0.1395)
Net Worth		-0.0642 (0.0551)	-0.0389 (0.0638)	-0.0148 (0.0829)	-0.0162 (0.0823)
Predicted Unemp		-0.0810* (0.0426)	-0.0636 (0.0507)	-0.0296 (0.0476)	-0.0342 (0.0478)
Self-employed		-0.4930** (0.2304)	-0.8703*** (0.2560)	-1.1044*** (0.3004)	-1.1133*** (0.2981)
LTV		-0.7349 (0.8682)	-0.9153 (0.8662)	-11.7269 (9.0488)	-11.5780 (9.0288)
PMI Denied		-5.1072*** (0.7266)	-5.3945*** (0.9037)	-5.8765*** (0.9479)	-5.8987*** (0.9578)
Fixed Rate		-0.1332 (0.2364)	-0.2903 (0.2948)	-0.5966* (0.3169)	-0.5699* (0.3123)

Special Program		0.6352** (0.2638)	0.7793** (0.3933)	0.8664* (0.4470)	0.8751** (0.4451)
Loan Term		-0.0140 (0.0234)	-0.0202 (0.0288)	-0.0168 (0.0305)	-0.0174 (0.0302)
Gift		0.0275 (0.2148)	0.0122 (0.2314)	-0.0394 (0.2482)	-0.0442 (0.2481)
Cosigner		N/A	N/A	N/A	N/A
At Least 50		-0.3385 (0.2183)	-0.2372 (0.2494)	-0.3290 (0.3105)	-0.3143 (0.3156)
Married		-0.1262 (0.2596)	-0.0535 (0.3002)	-0.1292 (0.3426)	-0.1198 (0.3449)
Poor Tract		-0.5051** (0.2518)	-0.6743** (0.2719)	-0.8855** (0.3507)	-0.8887** (0.3526)
Minority Tract		-0.5254* (0.3031)	-0.3741 (0.3311)	-0.6539 (0.4691)	-0.6220 (0.4752)
Bankruptcy		-1.3440*** (0.2478)	-1.5760*** (0.2818)	5.4737 (4.8655)	5.2957 (4.8989)
Mortgage Credit History		-0.3736** (0.1692)	-0.4012** (0.1921)	7.5165*** (2.4442)	7.5338*** (2.4808)
Consumer Credit History		-0.3553*** (0.0408)	-0.4342*** (0.0518)	-2.0182** (0.8445)	-1.9591** (0.8289)
High LTV		-2.5002*** (0.5263)	-2.7768*** (0.9256)	-2.1270*** (0.6697)	-2.1721*** (0.6742)
Extreme LTV		2.3655 (1.8156)	2.8122 (2.3729)	3.9524* (2.3522)	4.0211* (2.3115)
Short Work Experience		0.0314 (0.3854)	-0.2024 (0.4484)	0.0553 (0.4219)	0.1196 (0.4358)
High School		0.1145 (0.2063)	0.4517** (0.2096)	0.4165** (0.2079)	0.4368** (0.2093)
Dependents		-0.0018 (0.1056)	-0.0342 (0.1208)	-0.0413 (0.1082)	-0.0412 (0.1083)
County fixed effects	Y	Y	Y	Y	Y
Lender fixed effects	N	N	Y	Y	Y
Key Underwriting Variable and Lender Portfolio Interactions	N	N	N	Y	Y
Constant	Y	Y	Y	Y	Y
N	1,935	1,935	1,935	1,935	1,935

Note: To address the concern that *Same-Sex* borrowers have more presence in multi-family units, and are more likely to have a cosigner, we now restrict our sample to those applicants for single-family units and without a cosigner, and re-run regressions similar to that of Table 2. We combine lenders with singular observation to a common fixed effect. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S10: Robustness Check with Boston Fed Data: B

Variables	Logit (1) Approve	Logit (2) Approve	Logit (3) Approve	Logit (4) Approve	Logit (5) Approve
Same-Sex	-1.3961* (0.7502)	-1.9425** (0.7563)	-2.0916** (1.0358)	-2.9620*** (1.1482)	-1.0019 (1.3403)
[Average Marginal Effect]	[-0.1768]	[-0.1737]	[-0.1481]	[-0.1726]	[-0.0581]
LG_TractPct	-0.0298** (0.0127)	-0.0351** (0.0178)	-0.0299 (0.0217)	-0.0464* (0.0272)	-0.0363 (0.0285)
[Average Marginal Effect]	[-0.0038]	[-0.0031]	[-0.0021]	[-0.0027]	[-0.0021]
Same-Sex*LG_TractPct					-0.1535** (0.0774)
[Average Marginal Effect]					[-0.0089]
Co-applicant	-0.1882 (0.4435)	-0.0051 (0.6205)	0.4575 (0.6461)	1.2804 (0.8354)	1.4319* (0.8667)
Co-applicant* LG_TractPct	0.4627 (0.3318)	0.5259 (0.4080)	0.3070 (0.3809)	-0.3525 (0.6004)	-0.5208 (0.6162)
Minority	-0.5135** (0.2141)	-0.3231 (0.2676)	-0.4716 (0.3319)	0.0231 (0.4360)	0.0451 (0.4475)
Log Income	0.1379 (0.2096)	-0.2327 (0.2706)	-0.2430 (0.2677)	-0.2338 (0.3677)	-0.2314 (0.3824)
Male	-0.7530** (0.3210)	-0.7922*** (0.2870)	-1.1188*** (0.3341)	-1.2050*** (0.4236)	-1.2203*** (0.4240)
Multi-Family	-0.4861** (0.2202)	-0.5695* (0.3402)	-0.5205 (0.4549)	-0.5533 (0.5545)	-0.5766 (0.5561)
Owner Occupied	-0.2989 (0.3930)	0.2587 (0.4231)	0.4357 (0.6021)	0.2095 (0.5510)	0.2620 (0.5529)
HETI		-0.0143 (0.0167)	-0.0179 (0.0188)	-0.7643*** (0.2617)	-0.7482*** (0.2597)
TDTI		-0.0518** (0.0229)	-0.0681** (0.0326)	0.4351* (0.2277)	0.4219* (0.2258)
Net Worth		0.1374 (0.1610)	0.1716 (0.2026)	0.3103 (0.1980)	0.3014 (0.1982)
Predicted Unemp		-0.0760 (0.0615)	-0.0367 (0.0731)	0.0371 (0.0978)	0.0418 (0.1002)
Self-employed		-0.3656 (0.3154)	-0.7562* (0.4398)	-1.6943*** (0.4611)	-1.7189*** (0.4555)
LTV		0.0727 (0.3901)	-1.0126 (1.1023)	-64.7679*** (23.1523)	-67.9665*** (22.9887)
PMI Denied		N/A	N/A	N/A	N/A
Fixed Rate		0.2862 (0.2441)	0.1356 (0.3436)	-0.1844 (0.4585)	-0.1977 (0.4517)

Special Program		0.2848 (0.3887)	1.0580** (0.4636)	0.7766 (0.7062)	0.7809 (0.7182)
Loan Term		-0.0120 (0.0252)	0.0073 (0.0419)	-0.0002 (0.0434)	-0.0058 (0.0448)
Gift		-0.3412 (0.3390)	-0.1656 (0.4025)	-0.3908 (0.5499)	-0.4422 (0.5297)
Cosigner		1.0761** (0.5307)	1.7901** (0.8742)	2.0909** (1.0321)	2.0096** (0.9640)
At Least 50		N/A	N/A	N/A	N/A
Married		0.0732 (0.3504)	0.3087 (0.4759)	-0.0297 (0.5977)	-0.0445 (0.5878)
Poor Tract		-0.6932** (0.2969)	-0.9027** (0.4218)	-1.2384** (0.5655)	-1.2998** (0.5861)
Minority Tract		-0.9714*** (0.3263)	-1.2703*** (0.3680)	-1.8421*** (0.4804)	-1.8864*** (0.5024)
Bankruptcy		-1.0629*** (0.2874)	-1.1458*** (0.4149)	21.9751** (8.6270)	21.0348*** (7.6303)
Mortgage Credit History		-0.4019** (0.1742)	-0.4359* (0.2329)	10.9939** (4.3594)	11.4715*** (4.2369)
Consumer Credit History		-0.3461*** (0.0438)	-0.4461*** (0.0589)	-1.1439 (1.4471)	-1.2743 (1.3693)
High LTV		-2.6069*** (0.5831)	-2.0053* (1.0753)	-1.7799 (1.3329)	-1.7402 (1.3232)
Extreme LTV		0.9551 (1.7296)	-14.9994*** (1.6516)	-6.5279 (4.2770)	-5.0751 (4.2558)
Short Work Experience		0.3260 (0.5633)	0.3389 (0.6297)	0.4979 (1.1033)	0.3475 (1.1355)
High School		-0.1542 (0.3149)	0.2218 (0.4143)	0.2841 (0.4197)	0.2869 (0.4198)
Dependents		-0.0505 (0.0941)	-0.0809 (0.1139)	-0.1361 (0.1363)	-0.1430 (0.1349)
County fixed effects	Y	Y	Y	Y	Y
Lender fixed effects	N	N	Y	Y	Y
Key Underwriting Variable and Lender Portfolio Interactions	N	N	N	Y	Y
Constant	Y	Y	Y	Y	Y
N	1,072	1,072	1,072	1,072	1,072

Note: To address the concern that *Same-Sex* borrowers are younger, and the possible dad-son pairs, here we restrict the sample to be over 50 years and with no dependent, and re-run regressions similar to that of Table 2. We combine lenders with singular observation to a common fixed effect. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S11: Robustness Check with HMDA National Data (1990-2015)

Variables	Logit (1)	Average Marginal Effect	Logit (2)	Average Marginal Effect	Linear Prob. (3)	Linear Prob. (4)	Linear Prob. (5)	Linear Prob. (6)	Linear Prob. (7)
	Approve	Logit (1)	Approve	Logit (2)	Approve	Approve	Approve	Approve	Approve
Same-Sex	-0.1691*** (0.0494)	-0.0224	-0.4427*** (0.0855)	-0.0587	-0.0829*** (0.0158)	-0.0403*** (0.0086)	-0.0643*** (0.0145)	-0.0389*** (0.0083)	-0.0369*** (0.0077)
LG_CountyPct			-0.0610*** (0.0095)	-0.0081	-0.0065*** (0.0012)	-0.0019*** (0.0004)	-0.0086*** (0.0018)	-0.0035*** (0.0008)	
Same-Sex*LG_CountyPct			0.0542*** (0.0132)	0.0072	0.0105*** (0.0023)	0.0041*** (0.0015)	0.0072*** (0.0020)	0.0038*** (0.0014)	0.0035*** (0.0013)
Lendershare_County	0.0098 (0.0096)	0.0013	0.0098 (0.0093)	0.0013	0.0008 (0.0013)	0.0019*** (0.0006)	0.0013 (0.0011)	0.0025*** (0.0005)	0.0027*** (0.0004)
LTI	-0.0644*** (0.0165)	-0.0085	-0.0642*** (0.0165)	-0.0085	-0.0125*** (0.0027)	-0.0181*** (0.0010)	-0.0143*** (0.0028)	-0.0194*** (0.0011)	-0.0203*** (0.0011)
Log Income	0.4581*** (0.0512)	0.0608	0.4573*** (0.0509)	0.0607	0.0554*** (0.0079)	0.0302*** (0.0029)	0.0515*** (0.0074)	0.0286*** (0.0031)	0.0262*** (0.0031)
Male	0.4564*** (0.0232)	0.0606	0.4546*** (0.0231)	0.0603	0.0721*** (0.0057)	0.0359*** (0.0020)	0.0710*** (0.0054)	0.0364*** (0.0020)	0.0357*** (0.0019)
Loan Occupancy	0.0216 (0.0481)	0.0029	0.0206 (0.0480)	0.0027	0.0059 (0.0064)	0.0266*** (0.0030)	-0.0015 (0.0061)	0.0223*** (0.0029)	0.0217*** (0.0027)
Hispanic	-0.3864*** (0.0210)	-0.0513	-0.3846*** (0.0211)	-0.0510	-0.0712*** (0.0041)	-0.0512*** (0.0047)	-0.0617*** (0.0029)	-0.0495*** (0.0034)	-0.0494*** (0.0034)
Black	-0.8085*** (0.0219)	-0.1073	-0.8047*** (0.0222)	-0.1067	-0.1368*** (0.0046)	-0.0917*** (0.0031)	-0.1294*** (0.0045)	-0.0874*** (0.0030)	-0.0861*** (0.0027)

Asian	-0.1651*** (0.0206)	-0.0219	-0.1640*** (0.0207)	-0.0217	-0.0183*** (0.0026)	-0.0202*** (0.0014)	-0.0211*** (0.0022)	-0.0235*** (0.0015)	-0.0236*** (0.0015)
Other race	-0.6086*** (0.0602)	-0.0808	-0.6062*** (0.0602)	-0.0804	-0.0983*** (0.0128)	-0.0571*** (0.0053)	-0.0914*** (0.0123)	-0.0557*** (0.0053)	-0.0555*** (0.0052)
Purpose: Improvement	-0.7953*** (0.1142)	-0.1097	-0.7999*** (0.1128)	-0.1103	-0.1192*** (0.0157)	-0.0835*** (0.0152)	-0.1203*** (0.0140)	-0.0844*** (0.0146)	-0.0860*** (0.0140)
Purpose: Refinance	-0.4856*** (0.1013)	-0.0611	-0.4884*** (0.1005)	-0.0614	-0.0615*** (0.0127)	-0.0343*** (0.0048)	-0.0635*** (0.0116)	-0.0351*** (0.0047)	-0.0356*** (0.0046)
Loan Type: FHA	0.2557*** (0.0785)	0.0320	0.2533*** (0.0780)	0.0317	0.0407*** (0.0112)	-0.0065 (0.0048)	0.0421*** (0.0101)	-0.0042 (0.0046)	-0.0022 (0.0043)
Loan Type: VA	0.3053*** (0.1128)	0.0376	0.3003*** (0.1120)	0.0371	0.0432*** (0.0133)	0.0116*** (0.0043)	0.0442*** (0.0124)	0.0124*** (0.0042)	0.0132*** (0.0040)
Loan Type: FSA/RHS	0.3168*** (0.1106)	0.0389	0.3127*** (0.1093)	0.0385	0.0417*** (0.0139)	-0.0076 (0.0103)	0.0532*** (0.0128)	0.0035 (0.0107)	0.0015 (0.0096)
Tract Demographic Controls	Y		Y		Y	Y	Y	Y	N/A
Year fixed effects	Y		Y		Y	Y	Y	Y	N/A
County fixed effects	Y		Y		N	N	N	N	N
Lender fixed effects	N		N		N	Y	N	Y	Y
Census Tract fixed effects	N		N		N	N	Y	Y	N/A
Census Tract*Year fixed effects	N		N		N	N	N	N	Y
Constant	Y		Y		Y	Y	Y	Y	Y
N	28,175,224		28,175,224		28,175,224	28,175,224	28,175,224	28,175,224	28,175,224
adj. R2	N/A		N/A		0.064	0.192	0.081	0.198	0.209

Note: These results are based on a 100% *Same-Sex* sample plus a 20% heterosexual sample. To rule out dad-son or brothers like *Same-Sex* pairs, we retain *Same-Sex*=1 observations only if main-applicant race \neq co-applicant race. And then we re-run the regressions similar to that of Table 4. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S12: High Rate Spread Disclosure

Variables	Liner Probability (1) Premium_Report	Liner Probability (2) Premium_Report	Liner Probability (3) Premium_Report
Same-Sex	0.0070*** (0.0020)	0.0071*** (0.0020)	0.0114*** (0.0039)
LG_CountyPct		-0.0004 (0.0003)	-0.0003 (0.0003)
Same-Sex * LG_CountyPct			-0.0008 (0.0005)
Lendershare_County	0.0009* (0.0005)	0.0009* (0.0005)	0.0009* (0.0005)
Male	-0.0043*** (0.0010)	-0.0043*** (0.0010)	-0.0043*** (0.0010)
Log Income	-0.0094*** (0.0010)	-0.0094*** (0.0010)	-0.0094*** (0.0010)
First Time	-0.0037** (0.0018)	-0.0036** (0.0018)	-0.0036** (0.0018)
Num_Unit	-0.0022** (0.0011)	-0.0022** (0.0010)	-0.0022** (0.0010)
Mortgage Insurance_Pct	0.0007*** (0.0002)	0.0007*** (0.0002)	0.0007*** (0.0002)
Hispanic	0.0132*** (0.0019)	0.0132*** (0.0019)	0.0132*** (0.0019)
Black	0.0394*** (0.0042)	0.0396*** (0.0042)	0.0396*** (0.0042)
Asian	-0.0032*** (0.0011)	-0.0031*** (0.0011)	-0.0031*** (0.0011)
Other race	0.0037 (0.0028)	0.0037 (0.0028)	0.0037 (0.0028)
Loan Purpose	-0.0069*** (0.0024)	-0.0069*** (0.0024)	-0.0069*** (0.0024)
Occupied	0.0345*** (0.0047)	0.0345*** (0.0047)	0.0344*** (0.0047)
OLTV Bins	Y	Y	Y
DTI Bins	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y
Loan Month fixed effects	Y	Y	Y
Lender*County fixed effects	Y	Y	Y
Constant	Y	Y	Y
N	420,175	420,175	420,175
Adj. R ²	0.0798	0.0798	0.0798

Note: This table presents linear probability regression results for high rate spread disclosure. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S13: Cox Proportional Hazard Model on Duration before Default

Variables	Hazard (1) Duration	Hazard (2) Duration	Hazard (3) Duration	Hazard (4) Duration
Same-Sex	-0.0690 (0.0433)	-0.0692 (0.0434)	-0.1372 (0.1156)	-0.1315 (0.1159)
LG_CountyPct		-0.0305 (0.0337)	-0.0310 (0.0337)	-0.0217 (0.0355)
Same-Sex * LG_CountyPct			0.0128 (0.0215)	0.0123 (0.0210)
Lendershare_County	0.1508*** (0.0236)	0.1508*** (0.0236)	0.1510*** (0.0236)	0.1341*** (0.0257)
Contractual Rate				-0.0042 (0.0044)
Male	0.0099 (0.0249)	0.0100 (0.0249)	0.0100 (0.0249)	0.0180 (0.0260)
Log Income	0.0807*** (0.0186)	0.0808*** (0.0187)	0.0811*** (0.0186)	0.0769*** (0.0196)
First Time	-0.0828** (0.0334)	-0.0827** (0.0333)	-0.0827** (0.0333)	-0.0854** (0.0356)
Num_Units	-0.0335 (0.0283)	-0.0339 (0.0281)	-0.0342 (0.0282)	-0.0409 (0.0290)
Mortgage Insurance_Pct	0.0010 (0.0032)	0.0010 (0.0032)	0.0010 (0.0032)	0.0022 (0.0031)
Hispanic	0.0595* (0.0331)	0.0592* (0.0329)	0.0592* (0.0329)	0.0546 (0.0350)
Black	-0.0388 (0.0404)	-0.0378 (0.0400)	-0.0382 (0.0400)	-0.0396 (0.0398)
Asian	0.0233 (0.0636)	0.0214 (0.0640)	0.0211 (0.0639)	0.0333 (0.0647)
Other race	-0.0398 (0.1284)	-0.0362 (0.1268)	-0.0363 (0.1269)	-0.0409 (0.1236)
Loan purpose	0.0670*** (0.0215)	0.0674*** (0.0215)	0.0676*** (0.0214)	0.0616*** (0.0218)
Occupied	-0.1447*** (0.0271)	-0.1456*** (0.0271)	-0.1453*** (0.0272)	-0.1302*** (0.0305)
OLTV Bins	Y	Y	Y	Y
DTI Bins	Y	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y	Y
Loan Month fixed effects	Y	Y	Y	Y
County fixed effects	Y	Y	Y	Y
Lender fixed effects	N	N	N	Y
N	17,137	17,137	17,137	17,137

Note: This table presents the Cox Proportional Hazard Model regression results for duration before default. Standard errors in parentheses are robust and clustered at the MSA level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S14: OLS Model of the *Same-Sex* Percentage across Lenders

Variables	OLS (1) Same_Pct	OLS (2) Same_Pct
Lendersize_100pct	-0.0029 (0.0036)	-0.0051 (0.0035)
Male_Pct	-0.116*** (0.0208)	-0.117*** (0.0209)
Hispan_Pct	0.0184** (0.0084)	0.0180** (0.0088)
Black_Pct	0.0539*** (0.0131)	0.0429*** (0.0132)
Asian_Pct	0.0269*** (0.0102)	0.0194* (0.0105)
Otherrace_Pct	0.0844 (0.0595)	0.0856 (0.0595)
Occup_Pct	-0.116*** (0.0216)	-0.122*** (0.0219)
Lti_Avg	0.562** (0.244)	0.553** (0.248)
Lincome_Avg	-1.919*** (0.537)	-2.230*** (0.541)
State fixed effects	N	Y
Constant	Y	Y
N	112,206	112,206
Adj. R ²	0.021	0.031

Note: This table presents the regression results for the *Same-Sex* percentage across lenders. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table S15: OLS Model on Loan Approval and Contractual Rate for Individually Insignificant Lenders

Variables	Linear Probability Model Approve	OLS Contractual Rate
Same-Sex	-0.0200** (0.0095)	0.0264*** (0.0085)
LG_CountyPct	-0.0051*** (0.0012)	0.0009* (0.0005)
Same-Sex*LG_CountyPct	0.0053*** (0.0019)	-0.0026* (0.0015)
Lendershare_County	0.0064*** (0.0003)	-0.0001 (0.0002)
Log Income	0.0157*** (0.0017)	-0.0568*** (0.0014)
Male	0.0359*** (0.0019)	-0.0103*** (0.0020)
Occupied	0.0208*** (0.0027)	0.3116*** (0.0019)
Hispanic	-0.0209*** (0.0029)	0.0058 (0.0036)
Black	-0.1300*** (0.0036)	0.0135*** (0.0048)
Asian	-0.0017 (0.0036)	-0.0011 (0.0034)
Other race	-0.0811*** (0.0066)	-0.0039 (0.0093)
LTI	-0.0248*** (0.0007)	
First Time		-0.0008 (0.0024)
Num_Units		0.0679*** (0.0021)
Mortgage Insurance_Pct		0.0002 (0.0003)
OLTIV Bins	N	Y
DTI Bins	N	Y
Credit Score Bins (Both Applicants)	N	Y
Loan Purpose	Y	Y
Loan Type	Y	N/A
Census Tract Demographic Controls	Y	Y
Time fixed effects	Y (Year)	Y (Month)
County fixed effects	Y	Y
Lender fixed effects	Y	Y
Constant	Y	Y
N	330,773	192,229
adj. R2	0.3000	0.9108

Note: This table presents pooled regression results for loan approval and contractual rate for lenders with either insignificant or unexpected signs. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Boston Fed Data Results

Variables	Logit (1) Approve	Logit (2) Approve	Logit (3) Approve	Logit (4) Approve	Logit (5) Approve
Same-Sex	-0.4585 (0.3330)	-1.0274*** (0.3885)	-1.1878*** (0.4127)	-1.2913** (0.5478)	-0.3855 (0.7507)
[Average Marginal Effect]	[-0.0542]	[-0.0851]	[-0.0864]	[-0.0846]	[-0.0252]
LG_TractPct	-0.0181* (0.0093)	-0.0273* (0.0160)	-0.0262 (0.0175)	-0.0330** (0.0161)	-0.0250 (0.0172)
[Average Marginal Effect]	[-0.0021]	[-0.0023]	[-0.0019]	[-0.0022]	[-0.0016]
Same-Sex*LG_TractPct					-0.0642** (0.0256)
[Average Marginal Effect]					[-0.0042]
Co-applicant	0.0945 (0.3783)	0.2343 (0.5020)	0.5197 (0.5409)	0.5531 (0.6109)	0.6168 (0.6105)
Co-applicant* LG_TractPct	0.1406 (0.2809)	0.3343 (0.3414)	0.0777 (0.3545)	0.0569 (0.3798)	-0.0001 (0.3741)
Minority	-0.7697*** (0.1518)	-0.5107** (0.2069)	-0.5304** (0.2555)	-0.3607 (0.2796)	-0.3828 (0.2856)
Log Income	0.0457 (0.1433)	-0.0172 (0.1720)	-0.0275 (0.1848)	0.1581 (0.2140)	0.1704 (0.2159)
Male	-0.2233 (0.1621)	-0.3412* (0.1883)	-0.3103 (0.2046)	-0.1952 (0.2003)	-0.1805 (0.1960)
Multi-Family	-0.4509*** (0.1515)	-0.4096* (0.2175)	-0.4549* (0.2680)	-0.2903 (0.2813)	-0.3287 (0.2843)
Owner Occupied	0.4768 (0.3416)	1.0508*** (0.2911)	1.1496*** (0.3832)	0.8567** (0.4322)	0.8752** (0.4272)
HETI		0.0003 (0.0132)	-0.0031 (0.0159)	0.1225 (0.1871)	0.1197 (0.1886)
TDII		-0.0605*** (0.0167)	-0.0751*** (0.0204)	0.0991 (0.1436)	0.0997 (0.1449)
Net Worth		-0.0761 (0.0467)	-0.0621 (0.0563)	-0.0105 (0.0708)	-0.0153 (0.0704)
Predicted Unemp		-0.0736* (0.0383)	-0.0586 (0.0460)	-0.0449 (0.0488)	-0.0485 (0.0481)
Self-employed		-0.4835** (0.2082)	-0.8237*** (0.2226)	-1.0509*** (0.2495)	-1.0589*** (0.2481)
LTV		-0.5256 (0.3741)	-0.6108 (0.4373)	-14.4327** (6.5488)	-14.4011** (6.5949)
PMI Denied		-5.2570*** (0.6502)	-5.6805*** (0.8204)	-5.8985*** (0.8730)	-5.9216*** (0.8841)
Fixed Rate		-0.1763 (0.2190)	-0.2294 (0.2910)	-0.4121 (0.3181)	-0.4077 (0.3184)

Special Program		0.5901** (0.2588)	0.8734*** (0.3339)	1.0029** (0.4296)	1.0132** (0.4296)
Loan Term		-0.0089 (0.0201)	0.0003 (0.0241)	0.0112 (0.0274)	0.0107 (0.0274)
Gift		-0.0258 (0.2236)	-0.0791 (0.2558)	-0.1575 (0.2598)	-0.1617 (0.2588)
Cosigner		0.6925* (0.3939)	0.7105 (0.4823)	0.4421 (0.4524)	0.3933 (0.4576)
Age		-0.2737 (0.1824)	-0.1919 (0.1945)	-0.2350 (0.2325)	-0.2280 (0.2346)
Married		-0.0300 (0.2295)	0.0625 (0.2663)	-0.0156 (0.2808)	-0.0162 (0.2814)
Poor Tract		-0.2695 (0.2234)	-0.3399 (0.2470)	-0.5066* (0.2703)	-0.5136* (0.2684)
Minority Tract		-0.3325 (0.2706)	-0.2789 (0.2902)	-0.3839 (0.2888)	-0.3755 (0.2875)
Pubic Record		-1.3405*** (0.2142)	-1.4976*** (0.2578)	0.5766 (3.6008)	0.3801 (3.6694)
Mortgage Payments		-0.4465*** (0.1397)	-0.4247*** (0.1583)	2.6370 (1.9573)	2.6185 (1.9887)
Consumer payments		-0.3524*** (0.0316)	-0.4160*** (0.0367)	-0.5524 (0.6570)	-0.5194 (0.6568)
High LTV		-2.7368*** (0.4022)	-3.1221*** (0.7246)	-2.8801*** (0.8075)	-2.9076*** (0.8036)
Extreme LTV		2.7327 (1.9569)	3.3589* (2.0099)	4.1790* (2.3780)	4.2025* (2.3486)
Short Work Experience		0.1268 (0.2865)	-0.0243 (0.3325)	0.2306 (0.3255)	0.2615 (0.3280)
High School		0.0130 (0.2073)	0.2384 (0.2284)	0.2489 (0.2200)	0.2537 (0.2231)
Dependents		-0.0627 (0.0800)	-0.0951 (0.0913)	-0.0970 (0.0802)	-0.0943 (0.0807)
County fixed effects	Y	Y	Y	Y	Y
Lender fixed effects	N	N	Y	Y	Y
Key Underwriting Variable and Lender Portfolio Interactions	N	N	N	Y	Y
Constant	Y	Y	Y	Y	Y
N	2,316	2,316	2,316	2,316	2,316

Note: Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: HMDA-based National Loan Approval (1990–2015)

Variables	Logit (1)	Average Marginal Effect(1)	Logit (2)	Average Marginal Effect(2)	Linear Probability (3)	Linear Probability (4)	Linear Probability (5)	Linear Probability (6)	Linear Probability (7)
Same-Sex	-0.1972*** (0.0248)	-0.0272	-0.3708*** (0.0277)	-0.0511	-0.0590*** (0.0049)	-0.0362*** (0.0026)	-0.0489*** (0.0042)	-0.0360*** (0.0024)	-0.0350*** (0.0022)
LG_CountyPct			-0.0650*** (0.0095)	-0.0090	-0.0075*** (0.0012)	-0.0023*** (0.0004)	-0.0093*** (0.0019)	-0.0039*** (0.0008)	N/A
Same-Sex *LG_CountyPct			0.0372*** (0.0049)	0.0051	0.0062*** (0.0008)	0.0017*** (0.0004)	0.0042*** (0.0008)	0.0016*** (0.0004)	0.0016*** (0.0003)
Lendershare	0.0079 (0.0096)	0.0011	0.0079 (0.0093)	0.0011	0.0005 (0.0014)	0.0018*** (0.0006)	0.0011 (0.0012)	0.0026*** (0.00049)	0.0028*** (0.0004)
LTI	-0.0532*** (0.0161)	-0.0073	-0.0534*** (0.0161)	-0.0074	-0.0108*** (0.0028)	-0.0172*** (0.0099)	-0.0127*** (0.0028)	-0.0185*** (0.0011)	-0.0193*** (0.0011)
Log Income	0.4527*** (0.0490)	0.0624	0.4508*** (0.0486)	0.0621	0.0580*** (0.0080)	0.0321*** (0.0029)	0.0535*** (0.0074)	0.0304*** (0.0031)	0.0282*** (0.0031)
Male	0.3147*** (0.0218)	0.0434	0.3119*** (0.0217)	0.0430	0.0503*** (0.0047)	0.0222*** (0.0014)	0.0496*** (0.0044)	0.0227*** (0.0014)	0.0224*** (0.0013)
Occupied	0.0038 (0.0469)	0.0005	0.0011 (0.0469)	0.0001	0.0025 (0.0065)	0.0256*** (0.0029)	-0.0038 (0.0062)	0.0215*** (0.0028)	0.0210*** (0.0027)
Hispanic	-0.3956*** (0.0227)	-0.0546	-0.396*** (0.0226)	-0.0545	-0.0724*** (0.0044)	-0.0534*** (0.0049)	-0.0645*** (0.0031)	-0.0525*** (0.0036)	-0.0522*** (0.0036)
Black	-0.7789*** (0.0229)	-0.1074	-0.777*** (0.0231)	-0.1071	-0.1370*** (0.0040)	-0.0936*** (0.0032)	-0.1300*** (0.0041)	-0.0890*** (0.0031)	-0.0878*** (0.0028)
Asian	-0.1849*** (0.0220)	-0.0255	-0.184*** (0.0221)	-0.0253	-0.0214*** (0.0029)	-0.0232*** (0.0018)	-0.0246*** (0.0025)	-0.0266*** (0.0015)	-0.0266*** (0.0015)
Other race	-0.5912***	-0.0815	-0.590***	-0.0813	-0.0982***	-0.0586***	-0.0909***	-0.0571***	-0.0571***

	(0.0596)		(0.0596)		(0.0123)	(0.0056)	(0.0119)	(0.0056)	(0.0054)
Improvement	-0.7809***	-0.1134	-0.7859***	-0.1141	-0.1230***	-0.0878***	-0.1250***	-0.0887***	-0.0903***
	(0.1106)		(0.1091)		(0.0162)	(0.0161)	(0.0142)	(0.0153)	(0.0146)
Refinancing	-0.4448***	-0.0588	-0.4476***	-0.0591	-0.0586***	-0.0336***	-0.0612***	-0.0345***	-0.0352***
	(0.0962)		(0.0954)		(0.0128)	(0.0049)	(0.0116)	(0.0048)	(0.0047)
Type: FHA	0.3458***	0.0442	0.3430***	0.0438	0.0559***	-0.0002	0.0545***	0.0014	0.0035
	(0.0771)		(0.0765)		(0.0116)	(0.0049)	(0.0101)	(0.0046)	(0.0043)
Type: VA	0.3267***	0.0419	0.3204***	0.0412	0.0466***	0.0121***	0.0467***	0.0124***	0.0132***
	(0.1104)		(0.1096)		(0.0134)	(0.0044)	(0.0124)	(0.0043)	(0.0041)
Type: FSA/RHS	0.3616***	0.0460	0.3576***	0.0455	0.0486***	-0.0066	0.0589***	0.0047	0.0025
	(0.1062)		(0.1049)		(0.0143)	(0.0103)	(0.0130)	(0.0108)	(0.0097)
Tract	Y		Y		Y	Y	Y	Y	N/A
Demographics									
Year fixed	Y		Y		Y	Y	Y	Y	N/A
effects									
County fixed	Y		Y		N	N	N	N	N
effects									
Lender fixed	N		N		N	Y	N	Y	Y
effects									
Tract fixed	N		N		N	N	Y	Y	N/A
effects									
Tract*Year fixed	N		N		N	N	N	N	Y
effects									
Constant	Y		Y		Y	Y	Y	Y	Y
N	33,664,547		33,664,547		33,664,547	33,664,547	33,664,547	33,664,547	33,664,547
adj. R2	N/A		N/A		0.0665	0.1914	0.0825	0.1973	0.2073

Note: These results are based on a 100% *Same-Sex* sample plus a 20% heterosexual sample. Logit regression results for loan approval are reported in columns 1 and 3 with average marginal effects reported in columns 2 and 4. Last five columns report the linear probability for loan approval with different model specification. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Tobit Regression on Rate Spread

Variables	Model 1 (Pre-2010) Rate Spread	Model 2 (Pre-2010) Rate Spread	Model 3 (Pre-2010) Rate Spread	Model 4 (Post-2010) Rate Spread	Model 5 (Post-2010) Rate Spread	Model 6 (Post-2010) Rate Spread
Same-Sex	0.1718*** (0.0113)	0.1722*** (0.0113)	0.1902*** (0.0155)	0.0452*** (0.0096)	0.0455*** (0.0096)	0.1032*** (0.0142)
LG_CountyPct		-0.0027 (0.0043)	-0.0024 (0.0043)		-0.0018 (0.0034)	-0.0008 (0.0034)
SameSex*LG_CountyPct			-0.0036 (0.0026)			-0.0128*** (0.0028)
Lendershare_County	0.0416*** (0.0016)	0.0415*** (0.0016)	0.0415*** (0.0016)	-0.0027*** (0.0010)	-0.0028*** (0.0010)	-0.0027*** (0.0010)
Male	-0.1582*** (0.0209)	-0.1585*** (0.0209)	-0.1584*** (0.0209)	-0.0285* (0.0150)	-0.0286* (0.0150)	-0.0285* (0.0151)
Log Income	-0.3091*** (0.0052)	-0.3088*** (0.0052)	-0.3088*** (0.0052)	-0.1573*** (0.0037)	-0.1573*** (0.0037)	-0.1573*** (0.0037)
First Time	-0.1328*** (0.0155)	-0.1323*** (0.0156)	-0.1323*** (0.0156)	0.1359*** (0.0103)	0.1362*** (0.0103)	0.1361*** (0.0103)
Num_Units	-0.0342* (0.0178)	-0.0339* (0.0179)	-0.0338* (0.0179)	-0.0460*** (0.0134)	-0.0458*** (0.0134)	-0.0456*** (0.0134)
Mortgage Insurance_Pct.	0.0159*** (0.0008)	0.0159*** (0.0008)	0.0159*** (0.0008)	0.0023*** (0.0004)	0.0023*** (0.0004)	0.0023*** (0.0004)
Hispanic	0.2084*** (0.0117)	0.2090*** (0.0117)	0.2090*** (0.0117)	0.1063*** (0.0091)	0.1066*** (0.0092)	0.1064*** (0.0092)
Black	0.5149*** (0.0134)	0.5161*** (0.0135)	0.5161*** (0.0135)	0.2280*** (0.0096)	0.2288*** (0.0096)	0.2288*** (0.0096)
Asian	-0.1780*** (0.0107)	-0.1771*** (0.0107)	-0.1772*** (0.0107)	0.0096 (0.0109)	0.0101 (0.0109)	0.0103 (0.0109)
Other race	0.1258*** (0.0139)	0.1261*** (0.0139)	0.1259*** (0.0139)	0.0744*** (0.0094)	0.0744*** (0.0095)	0.0748*** (0.0094)
Loan purpose	-0.3253*** (0.0208)	-0.3252*** (0.0209)	-0.3252*** (0.0209)	0.1303*** (0.0150)	0.1302*** (0.0150)	0.1300*** (0.0150)
Loan Occupancy	0.6133*** (0.0150)	0.6134*** (0.0150)	0.6133*** (0.0150)	0.6799*** (0.0174)	0.6799*** (0.0175)	0.6794*** (0.0175)
OLTV Bins	Y	Y	Y	Y	Y	Y
DTI Bins	Y	Y	Y	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y	Y	Y	Y
Loan Month fixed effects	Y	Y	Y	Y	Y	Y
Lender*County fixed effects	Y	Y	Y	Y	Y	Y
Constant	Y	Y	Y	Y	Y	Y
N	176,502	176,502	176,502	237,131	237,131	237,131

Note: This table reports Tobit regression results. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Linear Regression of Contractual Rate

Variables	OLS 1 (Full Sample) Contractual Rate	OLS 2 (Full Sample) Contractual Rate	OLS 3 (Full Sample) Contractual Rate	OLS 4 (Pre-2010) Contractual Rate	OLS 5 (Post-2010) Contractual Rate
Same-Sex	0.0183*** (0.0030)	0.0181*** (0.0030)	0.0288*** (0.0050)	0.0185** (0.0084)	0.0290*** (0.0058)
LG_CountyPct		0.0012 (0.0008)	0.0014* (0.0008)	0.0027** (0.0013)	0.0019** (0.0008)
Same-Sex*LG_CountyPct			-0.0021** (0.0008)	0.0004 (0.0013)	-0.0029*** (0.0010)
Lendershare_County	-0.0009 (0.0009)	-0.0009 (0.0009)	-0.0009 (0.0009)	-0.0020 (0.0015)	0.0010 (0.0011)
Male	-0.0040** (0.0017)	-0.0039** (0.0017)	-0.0039** (0.0017)	-0.0011 (0.0021)	-0.0064*** (0.0022)
Log Income	-0.0546*** (0.0017)	-0.0547*** (0.0017)	-0.0547*** (0.0017)	-0.0624*** (0.0034)	-0.0453*** (0.0022)
First Time	0.0006 (0.0033)	0.0004 (0.0033)	0.0004 (0.0033)	-0.0020 (0.0045)	0.0026 (0.0037)
Num_Units	0.0708*** (0.0045)	0.0707*** (0.0045)	0.0707*** (0.0045)	0.0479*** (0.0074)	0.0865*** (0.0034)
Mortgage Insurance_Pct	-0.0004 (0.0006)	-0.0004 (0.0006)	-0.0004 (0.0006)	0.0037*** (0.0009)	-0.0014*** (0.0004)
Hispanic	0.0115*** (0.0032)	0.0113*** (0.0032)	0.0113*** (0.0032)	-0.0062 (0.0044)	0.0212*** (0.0039)
Black	0.0161*** (0.0040)	0.0156*** (0.0040)	0.0156*** (0.0040)	0.0120* (0.0064)	0.0184*** (0.0048)
Asian	-0.0026 (0.0027)	-0.0028 (0.0026)	-0.0028 (0.0026)	-0.0048 (0.0039)	-0.0021 (0.0034)
Other race	0.0036 (0.0072)	0.0036 (0.0072)	0.0035 (0.0072)	0.0052 (0.0115)	0.0012 (0.0087)
Loan purpose	0.0432*** (0.0070)	0.0432*** (0.0070)	0.0432*** (0.0070)	0.0208*** (0.0076)	0.0648*** (0.0090)
Occupancy	0.3059*** (0.0067)	0.3059*** (0.0067)	0.3058*** (0.0067)	0.3213*** (0.0112)	0.2902*** (0.0048)
OLTV Bins	Y	Y	Y	Y	Y
DTI Bins	Y	Y	Y	Y	Y
Credit Score Bins (Both Applicants)	Y	Y	Y	Y	Y
Census Tract Demographic Controls	Y	Y	Y	Y	Y
Loan Month fixed effects	Y	Y	Y	Y	Y
Lender*County fixed effects	Y	Y	Y	Y	Y
Constant	Y	Y	Y	Y	Y
N	420,175	420,175	420,175	176,502	237,131
Adj. R ²	0.9097	0.9097	0.9097	0.7511	0.7511

Note: This table presents linear regression results for contractual rates. Standard errors in parentheses are robust and clustered at the lender level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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38. We merge by state, MSA, county, year, loan amount, loan purpose (e.g. purchase, refinancing, etc.), owner-occupancy, property type, and the presence of co-borrower. County information is inferred from Fannie Mae data via the first three digits of the reported zip codes.

- 39. It accounts for less than 0.005% of the matched observations.
- 40. See https://www.federalreserve.gov/boarddocs/supmanual/cch/fair_lend_over.pdf.
- 41. See <https://www.mba.org/Documents/mba.org/files/Research/HMDAFAQ.pdf>.
- 42. As there is only one lender per regression, the underlying significance test is based on robust standard error.